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ABSTRACTS

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(Pages refer to the Japanese originals of this volume unless otherwise noted.)

On the Acid Fermentation by *Aspergillus niger*. A Supplement to Part I.

(pp. 1033~1034)

By Kinichiro SAKAGUCHI and Sinitiro BABA.

(Tokyo Imperial University; Received June 26, 1942.)

In the previous paper⁽¹⁾ the authors have reported that their organisms (*Asp. niger* var. No. 2 and *Asp. niger* var. No. 25) were capable of forming citric acid from glycerol and ethanol, but not from pyruvic, formic acids or methanol. In the present work they investigated whether the presence of those substances exert

Table I. (C_2 , C_3 , C_4 & C_6). $P_H=6.4$, Cultural temp. $32\sim33^\circ$.

	Control	Na-Acetate	Ethanol	Na-Succinate	Na-Malate	Na-Pyruvate	Ca-Gluconate
Sugar present	3.64 g	3.64	3.64	3.64	3.64	3.64	3.64
Sugar remained	0.93	0.63	0.98	0.83	0.78	0.98	0.78
Sugar consumed	2.71	3.01	2.66	2.81	2.86	2.66	2.86
Citric acid formed	0.726	0.898	0.929	0.838	0.898	0.929	0.757
Film weight	2.957	2.519	2.782	3.213	3.116	2.920	3.163
Cultural age	24 hrs	65	24	24	24	24	24
Yield	100	123	127	115	123	127	104

(1) The substrates were added at the rate of 0.5% as free acids except ethanol.

(2) The mean value of parallel cultures are shown in the above table.

Table II. (C_1) $P_H=6.4$, Cultural temp. $32\sim33^\circ$.

	Control	Na-Formate	Methanol
Sugar present	2.18 gr	2.18	2.18
Sugar remained	0.60	0.83	0.60
Sugar consumed	1.58	1.35	1.58
Citric acid formed	0.233	0.290	0.496
Film weight	2.897	2.520	2.956
Cultural age	24 hrs	24	24
Yield	100	119	212

(1) The substrates were added at the rate of 1%.

(2) The above figures are the mean values of parallel cultures.

any effect upon the yield of citric acid from glucose. The results obtained are as follows.

Literature

- (1) This Journal, **18**, 405 (1942).

Studies on the Determination of Vitamin B₂ (Lactoflavin) in Various Food Materials.

(pp. 1035~1040)

By Ryusaku HOSINO, Mituo FUJITA, and
Hisasi ARIYAMA.

(The Laboratory of Food Supplies, the Yokosuka Naval Bureau of Munitions;
Received July 8, 1942.)

To estimate the lactoflavin in food materials, we modified Lunde's method in respect to the blank test, and measured the flavin content of 40 kinds of various foods and three kinds of cooked diet.

Über die Synthese von Chinolinsäuremethylbetainäthylester, das Isomer des „Fermentation-Auxin“ (sogenannt von Herrn Ootsu), und Prüfung auf ihr gährungförderndes Vermögen.

(SS. 1041~1043)

Von Teijiro YABUTA und Kinjiro TAMARI.

(Landwirtschaftliches Chemisches Laboratorium der Kaiserlichen Universität
zu Tokio: Eingegangen am 15. 6. 1942.)

Über die Verhinderung der Keimung der Kartoffel durch die Wirkung einer auxinähnlichen Substanz.

(pp. 1044~1046)

Von Teijiro YABUTA und Kinjiro TAMARI.

(Landwirtschaftliches Chemisches Laboratorium der Kaiserlichen Universität zu
Tokio: Eingegangen am 15. 6. 1942.)

Classification of Coli-aerogenes Group. (I)

(pp. 1047~1057)

By Seiji TADA.

(Agricultural Chemical Laboratory, Tokyo Imperial University;
Received March 3, 1942.)

**On the Contents of Vitamin C of Harbaceous
Plants in Spring.**

(pp. 1058~1061)

By Hisayosi IWATA and Syoji TIBA.

(Morioka Imperial College of Agriculture and Forestry;

Received June 10, 1942.)

**On the Influence of Some Inorganic Catalysers
Upon the Carbondioxide Production
of White Rats.**

(pp. 1062~1064)

By Tetutarō TADOKORO, Tuneyuki SAITO, and
Jizō HASHIMOTO.

(Hokkaido Imperial University; Received June 9, 1942.)

On the Fixation of Sericin of Raw Silk. (Part VIII).

Ageing Phenomenon of Sericin-fixed Cocoon Fibres.

(pp. 1065~1069)

By Masami OKU, Tuneo KURASAWA, and Hitosi HAJIMOTO.

(From the Chemical Fibre Laboratory, Ueda Imperial College of Sericulture
and Silk Industry; Received July 7, 1942.)

On the Fixation of Sericin of Raw Silk. (Part IX).

Effect of Finishing Chemicals upon Fixation Degrees.

(pp. 1070~1072)

By Masami OKU and Tuneo KURASAWA.

(From the Chemical Fibre Laboratory, Ueda Imperial College of Sericulture and
Silk Industry; Received June 14, 1942.)

On the Studies of Diastase. I.

(pp. 1073~1081)

By Toyosaku MINAGAWA, Tetuichi KATAOKA, Sadatosi HAYAKAWA,
and Kenitiro FUKUMA.

(The Institute of Physical and Chemical Research;
Received June 26, 1942.)

Enzymatic Studies on Cereals. (Part XV.)

On the Maltase in Rice.

(pp. 1082~1086)

By Gohei YAMAGISI.

(Morioka Imperial College of Agriculture and Forestry; Received July 27, 1942.)

Aufschluss von Bagasse mit Ca-Sulfitverfahren.

(SS. 1087~1091)

Von M. SIKATA, I. TATI und N. URANO.

(Aus d. Agrikulturchem. Institut d. Universität Kyoto;

Eingegangen am 20. Juli 1942.)

Diamino Sugars and their Filament Formation Ability.

Preliminary Report. 1,6-Diamino-2,3,4,5-

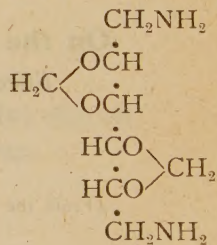
Dimethylene-mannitol.

(pp. 1092~1094)

By Yasuji HAMAMURA and Minoru OTUKA.

(Kyoto Sericultural College; Received July 18, 1942.)

The authors succeeded in the synthesis of 1,6-diamino-2,3,4,5-dimethylene-mannitol from 1,6-dichlor-dimethylene-mannitol⁽¹⁾ with conc. ammonia. This substance is syrup in ordinary temperature and distilled at 125~130° under 0.01 mm. $[\alpha]_D^{20} = +90.2^\circ$. It is soluble in water and alcohol, insoluble in ether, chloroform, benzene and other organic solvents. Its carbonate is fine crystalline plate, melting at 159~160°. Hydrochloric acid, nitric acid and oxalic acid salts are also crystalline substances, but have no melting point. Mucic acid forms a crystalline salt with it in molar proportion, and the salt is decomposed at 210°. With saccharic acid it forms a salt with two mol saccharic acid monolactone.



In the present case, we have not yet succeeded in deriving polyamide from the latter two salts on account of the effect of their free hydroxyl groups, but we have a hope to produce a polymar by covering their hydroxyl groups.

(1) F. MICHEEL: *Ann.*, 496, 77 (1932).

**On the Influence of Soil Acidity and Exchangeable
Lime Content for the Growth of
Forest Trees. (Part II).**

(pp. 1095~1100)

By R. KAWASHIMA and G. SUYAMA.

(Agr. Chem. Laboratory, Kyushu Imp. University; Received June 9, 1942.)

**Manufacture of Acetone and Butanol
by Fermentation. (3).**

(pp. 1101~1109)

By Ryuiti HATTORI

(Tokyo Imperial University; Received July 10, 1942.)

Carbohydrates in Proteins. Parts 1~2.

1. Estimation of Carbohydrate in Silk.
2. Isolation of a Glucoside from Silk.

(pp. 1110~1116)

By Y. INOUE and Y. KUDO.

(Biochem. Lab., Dept. of Agriculture, Kyoto Imperial University;
Received June 29, 1942.)

Recently, the presence of carbohydrate residue as a constituent has been reported, not only in gluco- or muco-proteins, but also in the so called simple protein. Especially, in 1934, M. Sørensen tested many proteins by the extinction curve process and demonstrated the presence and kinds of carbohydrates in proteins. As regards the isolation of such sugar residues or their derivatives, S. Fränkel, in 1927, obtained glucosaminemannobiose from egg-albumin, which P. A. Levene confirmed in 1929 and 1941, as glucosamine-mannose-mannose-trisaccharide. Rimington isolated the same sugar complex from ox serum in 1931 and Bierry, in 1934, obtained galactose-glucosamine-mannose from horse serum. Neuburger, Herwitt and Morgan also investigated along the same line. All of these researches, however, are confined to the determination of component sugar residues, not touching on the chemical constitution, and, moreover, nobody discussed the manner of linkage of sugar residues to peptides or amino acids which are the main constituents of the protein molecule.

The authors already isolated several glycosides from a number of proteins, all of which were N-glycosides of peptide or amino acids and those are now under investigation for the purposes of the determination of their constitutional formulae, including the manner of linkage, the arrangement of amino acid residues and kind of sugar residues. Besides it may be expected that some knowledge of their physiological meanings in proteins may also be obtained.

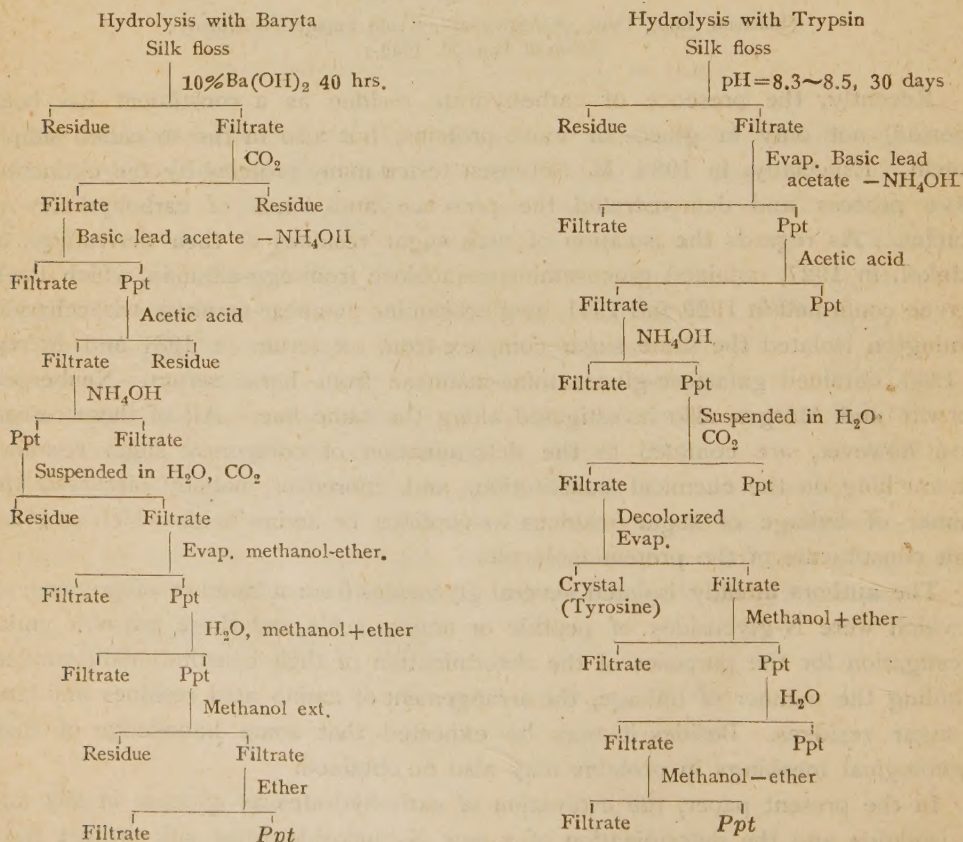
In the present paper, the estimation of carbohydrates as glucose in silk and the isolation and the determination of a new N-glucoside from silk protein have

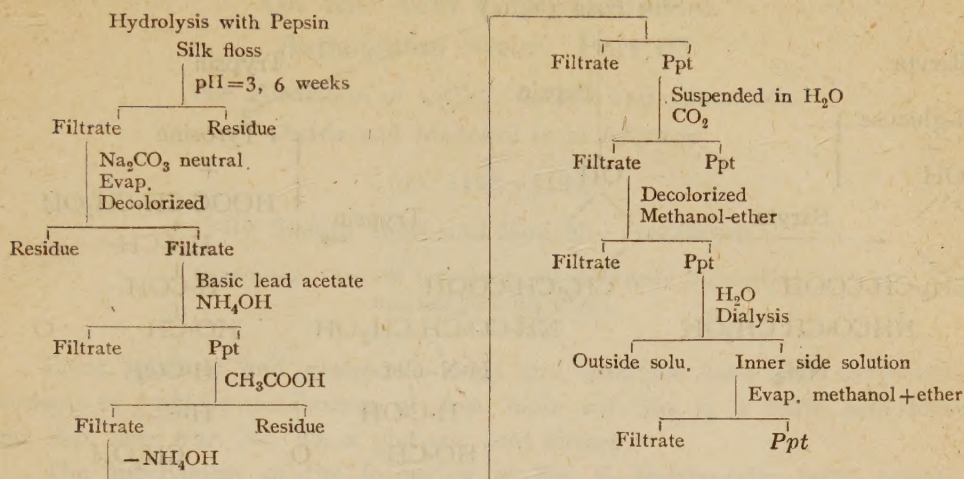
been described. The authors tested 18 kinds of silk cocoons and determined their sugar contents as glucose by means of the orcinol-sulphuric acid process, by which it was shown that the average value was 1.46% as described below. And from the fact that the purified fibroin contains only 0.3% of glucose, it could be seen that the most part of carbohydrate residues would predominate in the sericin layer.

European species	average of 3 kinds	1.35%
Japanese "	" " 5 "	1.41
Chinese "	" " 3 "	1.49
Hybrid "	" " 7 "	1.61
Univoltine "	" " 7 "	1.43
Bivoltine "	" " 4 "	1.50
Total average		1.46
Tensan-cocoon	0.83%	
Sakusan-cocoon	1.09	
Silk-floss (keba)	2.40	
Fibroin	0.30	

The value in sericin is too indefinite to define, perhaps owing to the methods of collecting or refining of sericin from cocoons, for instance, ranging from 2.40% to 5.83%.

The authors hydrolysed raw silk with baryta, trypsin and pepsin separately, using silk floss as main raw material. The procedures were simply tabulated as follows:

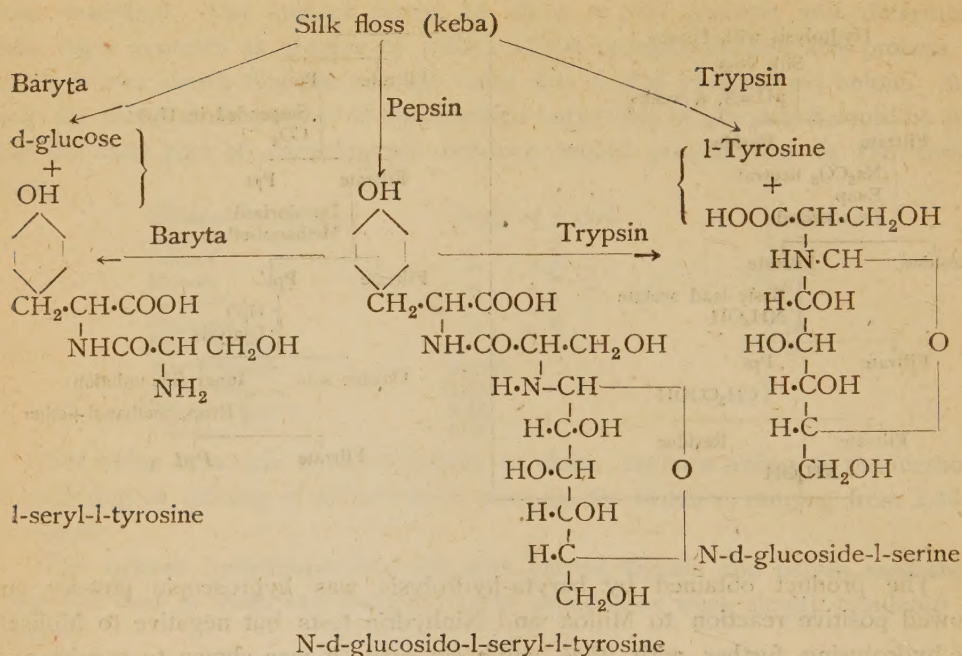




The product obtained by baryta-hydrolysis was hygroscopic powder and showed positive reaction to Millon and Ninhydrin tests but negative to Molisch. By hydrolysing further with 25% sulphuric acid, it was shown to consist of l-tyrosine and l-serine, of which β -naphthalene-sulfonyl derivative, m. p. 214°C, was identified. Subsequently the hydrolysis of the naphthalene-sulfonyl derivatives of this dipeptide proved to be l-seryl-l-tyrosine.

By hydrolysis with trypsin, the authors isolated white hygroscopic powder which gave Molisch and Ninhydrin reactions but not Millon's, and were non-reducible to Fehling solution until boiled for about 2 hrs. With 5% HCl, l-serine and d-glucose were obtained as decomposition products, glucose as osazone, m. p. 204°-205°, and serine as β -naphthalene-sulphonyl-serine, m. p. 214°. Accordingly the above product should be considered as a serine glucoside and was determined to be N- rather than O-glucoside from the fact that, in the authors' laboratory, Dr. Onodera is now investigating systematic synthesis of amino acid glucosides in which the different behavior of N-glucoside and O-glucoside to baryta solution was observed; O-glucosides being very stable to baryta while N-glucosides are unstable, and also the manner of the coloration by Ninhydrin reagent is distinctly different between the two glucosides: O-glucoside indicates the colour change spontaneously while N-glucoside displays it slowly after warming. Therefore, the hydrolysate by trypsin was concluded to be l-serine-N-d-glucoside.

By pepsin, white hygroscopic powder obtained was negative to Biuret but positive to Molisch, Ninhydrin and Millon and non-reducing. As the result of further hydrolysis with 25% H₂SO₄, l-tyrosine, l-serine and d-glucose were identified and it was shown that the hydrolysate by pepsin was N-d-glucosido-l-seryl-l-tyrosine, because, when the hydrolysate was further decomposed either with trypsin or with baryta, the same products as those obtainable by the direct decomposition of silk floss were always identified.



Although Abderhalden recognized, in 1932, the presence of glucosamine and glucuronic acid residues in silk protein, the authors failed to isolate a complex containing such a group in spite of their careful investigation.

On the Chemical Studies on Baggasse Pulp. (11)

(pp. 1117~1118)

By Tetutaro TADOKORO, Takesi SASAKI, and
Masao NISIDA.

(Hokkaido Imperial University; Received June 11, 1942.)

Untersuchungen über die Beziehungen von Bataten zur Alkoholprodukten. (VII).

(SS. 1119~1122)

Von K. SUEMATU, M. UTIKOSI und T. MATUMURU.

(The Institute of Reserch on Chemical Industry, Government-General of Taiwan, Nippon;
Received June 24, 1942.)

On the Acid Fermentation of *Aspergillus Niger*. Part III.

The Formation of Citric, Glutaric and Glutaconic
Acids and Mannitol from *l*-Xylose.

(pp. 1123~1126)

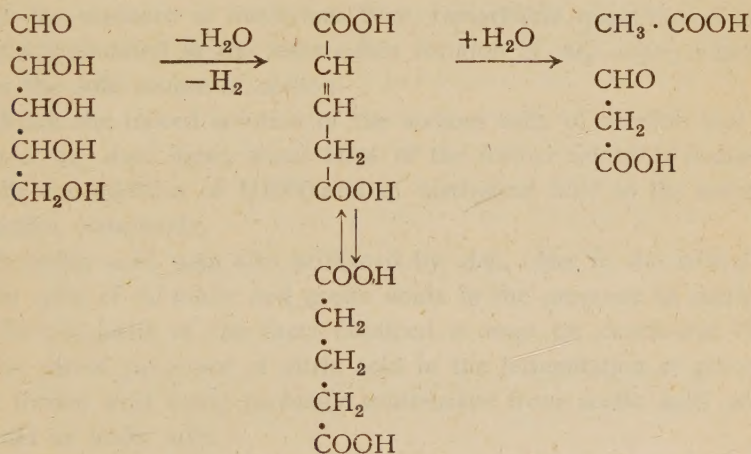
By Sinitiro BABA and Kinichiro SAKAGUCHI.

(Agricultural Chemical Laboratory, Tokyo Imperial University;

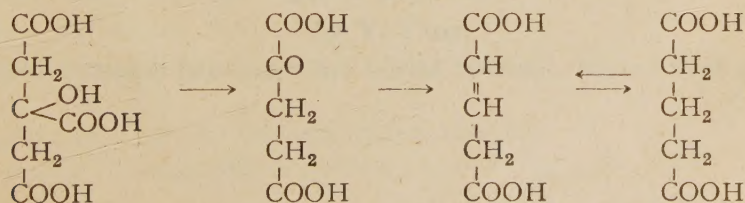
Received June 24, 1942.)

Citric, glutaric and glutaconic acids and mannitol have been confirmed on products of *l*-xylose metabolism of *Asp. niger* var. No. 2, a citric acid former, and *Asp. niger* var. No. 25, a gluconic acid former.

The mechanism of the formation of the C₅-dicarboxylic acids might be assumed in two ways. If the direct conversion of *l*-xylose to those acids is possible, the reaction may take place in accordance with the following equation, glutaconic acid being assumed as an intermediate in the further breakdown of the pentose,



Since, however, the high rates of citric acid production from *l*-xylose by the authors' organisms have been confirmed, the possible conversion of citric acid to those C₅-dicarboxylic acids might also be assumed.



The biological production of α -ketoglutaric acid from citric acid has already been reported by Martius⁽¹⁾ and Tada⁽²⁾.

LITERATURE.

- (1) MARTIUS: *Zeit. physiol. Chem.*, **247**, 104 (1937).
- (2) TADA: *This Journal*, **17**, 569 (1941).